Energy Management Organization

Table of Contents

1.0 What is EMO?

EMO (Energy Management Organization) is a special taskforce comprised of representatives from all production shops that focuses on the reduction of plantwide excess utility use. Using kaizen practices and team member suggestions, The NAMC can conserved natural resources and reduced operating costs. This page represents the reporting, analysis, and monitoring that the EMO performs.

1.1 EMO Mission Statement

NAMC's Energy Team's purpose is to directly and indirectly manage energy consumption and foster shop-to-shop interaction through effective research, training, operations, and support activities; to provide accurate tracking, reporting, and environmentally compliant activities, while maintaining production and quality levels.

1.2 Brief History

In 1992, Toyota created the Earth Charter to:

- Pursue and develop environment friendly technologies
- Develop an improvement plan to address environmental issues on a global scale
- Work towards zero emissions throughout all business activities

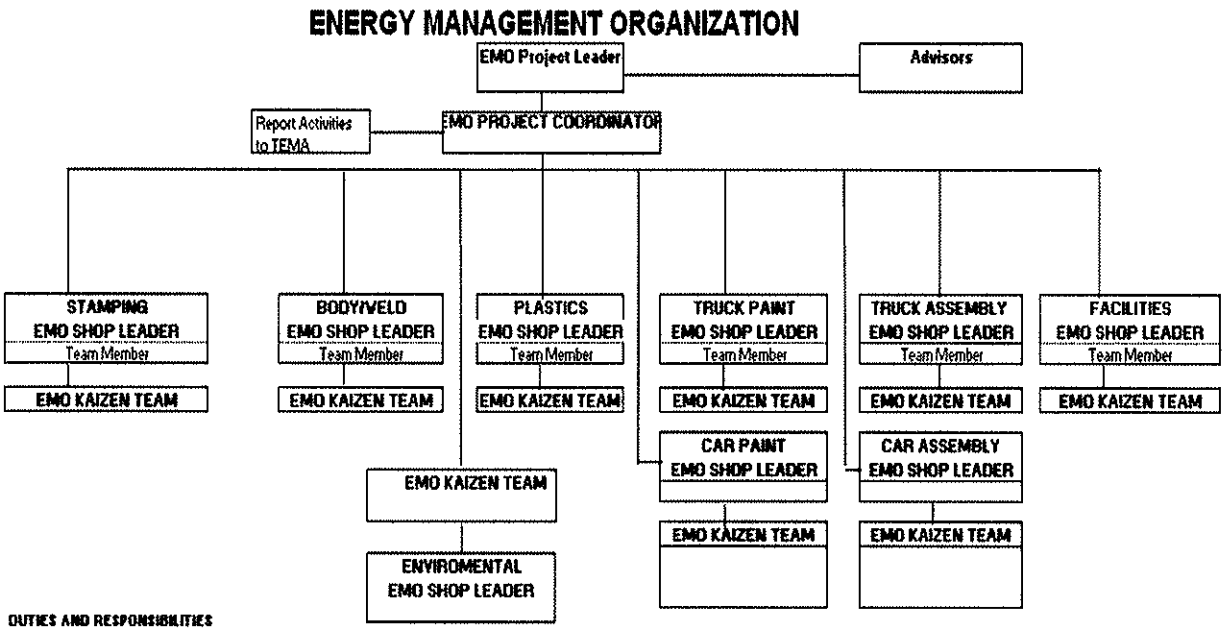
In 1998, Toyota obtained ISO 14001 Certification and thereafter established a comprehensive Environmental Management System (EMS). Through the EMS program, the Environmental Action Plans were developed, which aimed to:

- Reduce CO_2 emissions
- Conserve water resources
- Track energy usage and set reduction targets

GOALS:
To support the Environmental Action Plans, EMO was established to help:

- Analyze and report utility consumption
- Hold "Treasure Hunts" - energy audits to identify waste
- Evaluate and implement energy kaizens
- Track and document energy savings
- Foster shop-to-shop interaction and increase energy awareness
- Interface and report to T.E.M.A.
- Enhance energy efficiency through TPS methods
- Reduce vehicle cost through minimizing energy for production
- Promote sales through environmental friendly products

1.3 Example: EMO Organizational Chart



DUTIES AND RESPONSIBILITIES

A. EMO PROJECT LEADER

1. Develop monitoring system
2. Establish Annual Target and Utility Budget
3. Hold monthly meetings and issue minutes
4. Update Nissan EMO Handbook yearly
5. Support Walk Thru Audit

B. EMO PROJECT COORDINATOR

1. Support and assist all EMO Shop Leaders and Kaizen Teams to evaluate and implement Kaizen ideas
2. Document all Energy Savings Kaizen Activities plantwide
3. Regular field audit of all process and non-process equipment
4. Responsible with Facility Engineering EMO Web Site continuous operation and improvement
5. Provide weekly report of energy Demand Chart to all EMO Shop Leaders
6. Prepare all associated documentation to EMO meetings
7. Report all activities to TMMNA Cincinnati Head Office

C. EMO ADVISOR

1. Examine current process technology and recommend improvements

D. EMO SHOP LEADER

1. Enforce implementation of walk thru audit using EMO-1 form and make direction for immediate implementation
2. Develop process through assignments of Kaizen activities
3. Identify waste and report activities to EMO
4. Schedule Kaizen items for implementation
5. Report summary of Kaizen activities to EMO project leader

E. EMO KAIZEN TEAM

1. Audit all equipment current condition one time to establish benchmark
2. Reduce equipment run time not required during production
3. Eliminate waste during non production time
4. Implement Kaizen activities
5. Report all Kaizen activities to EMO shop leader
6. Review and re-audit all implemented Kaizen activities twice a year to verify target and make improvements if required and report results back to EMO shop

2.0 EMO Tools

2.1 Detail Sheets

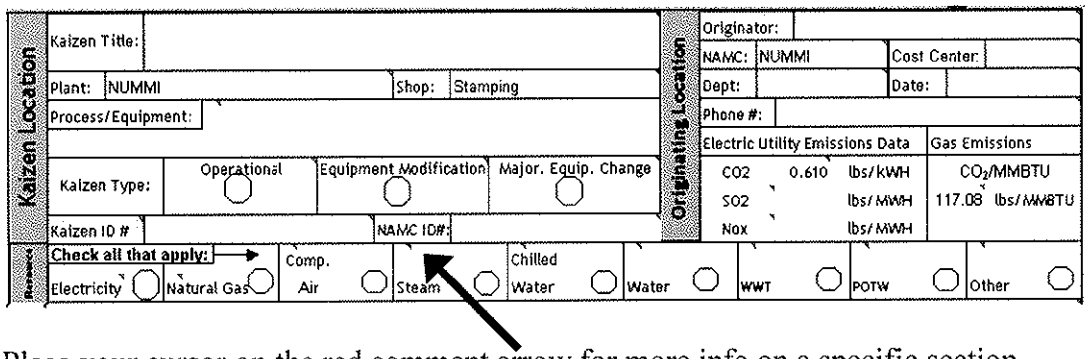
The Detail Sheet (DS) is a standard A3 Report Form used to document energy savings and provide proof to obtain CO_2 emission credits from the government. Each detail sheet has easy to use built-in calculator tabs, but should be completely filled out in order for it to be useful. The DS consists of the following sections and calculators:

***Kaizen Location*:** This section gives an overall introduction to the identified kaizen.

- Kaizen title: This gives a brief description of the kaizen
- Kaizen ID#: The serial number of the kaizen that specifies its content
- Process/ Equipment: The process and/or equipment undergoing kaizen
- Kaizen Type: What type of change is needed

***Originating Location*:** This section identifies the audited shop contact information.

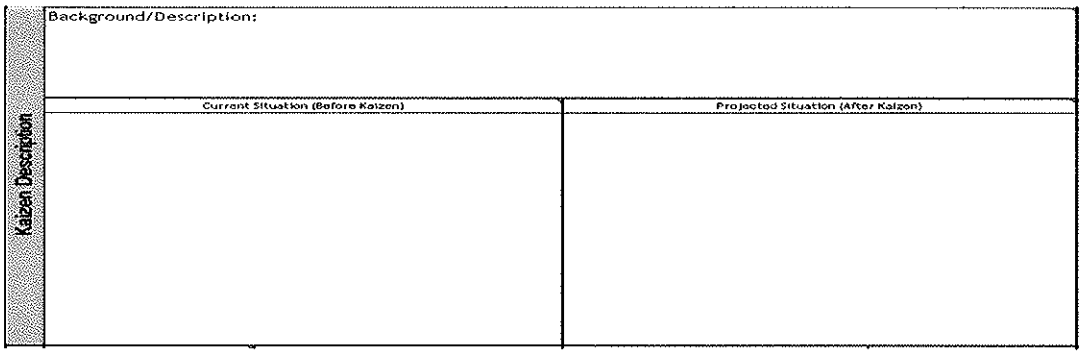
- Originator: The EMO shop rep hosting the current Treasure Hunt
- Dept: The audited shop
-



Note: Place your cursor on the red comment arrow for more info on a specific section

***Kaizen Description*:** This section explains the details of the identified kaizen.

- Background/ Description: This provides a brief history of the process and equipment
- Current Situation: This identifies the situation before kaizen
- Projected situation: This projects the outcome and savings of kaizen



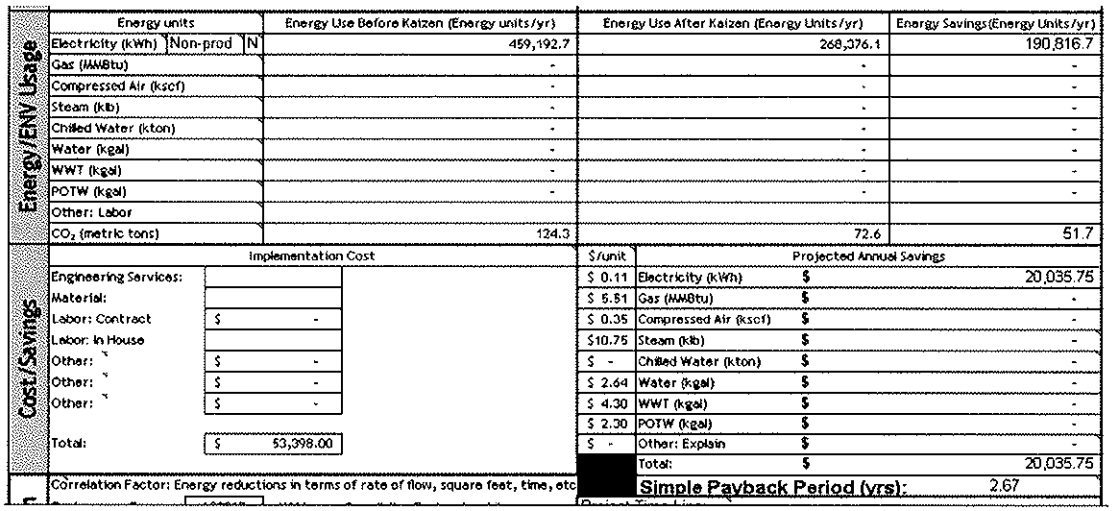
Kaizen Description	
Background/Description:	
Current Situation (Before Kaizen)	Projected Situation (After Kaizen)

***Energy Usage*:** This section shows energy usage before and after kaizen, along with the net energy savings. The numbers here are linked and automatically displayed by the calculator tabs.

***Cost/ Savings*:** This section shows the total cost and savings to implement kaizen.

- Implementation Cost: These numbers are manually inserted, and show the distribution of kaizen cost for labor, service, and material. The sum of the costs appears at the bottom.
- Projected Annual Savings: These numbers are automatically calculated from the energy savings, and show the projected money savings of each resource after kaizen. The projected total money savings appears at the bottom.

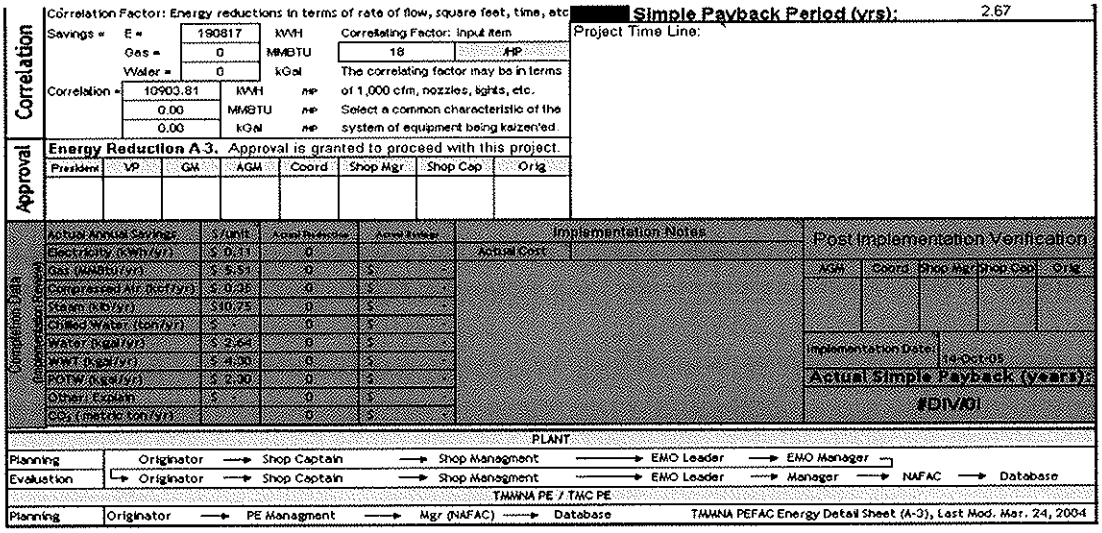
***Simple Payback Period*:** This automatic calculation indicates the time needed for kaizen to pay for itself by comparing the net energy savings vs. implementation cost.



Energy/ENV Usage	Energy units		Energy Use Before Kaizen (Energy units/yr)	Energy Use After Kaizen (Energy Units/yr)	Energy Savings (Energy Units/yr)
	Electricity (kWh)	Non-prod N	459,192.7	268,376.1	190,816.7
	Gas (MMBtu)		-	-	-
	Compressed Air (kscf)		-	-	-
	Steam (klb)		-	-	-
	Chilled Water (kton)		-	-	-
	Water (kgal)		-	-	-
	WWT (kgal)		-	-	-
	POTW (kgal)		-	-	-
	Other: Labor				
	CO_2 (metric tons)		124.3	72.6	51.7

Cost/Savings	Implementation Cost		$/unit	Projected Annual Savings		
	Engineering Services:		$ 0.11	Electricity (kWh)	$	20,035.75
	Material:		$ 6.81	Gas (MMBtu)	$	-
	Labor: Contract	$ -	$ 0.35	Compressed Air (kscf)	$	-
	Labor: In House		$10.75	Steam (klb)	$	-
	Other:	$ -	$ -	Chilled Water (kton)	$	-
	Other:	$ -	$ 2.64	Water (kgal)	$	-
	Other:	$ -	$ 4.30	WWT (kgal)	$	-
	Total:	$ 53,398.00	$ 2.30	POTW (kgal)	$	-
			$ -	Other: Explain	$	-
				Total:	$	20,035.75
	Correlation Factor: Energy reductions in terms of rate of flow, square feet, time, etc			Simple Payback Period (yrs):		2.67

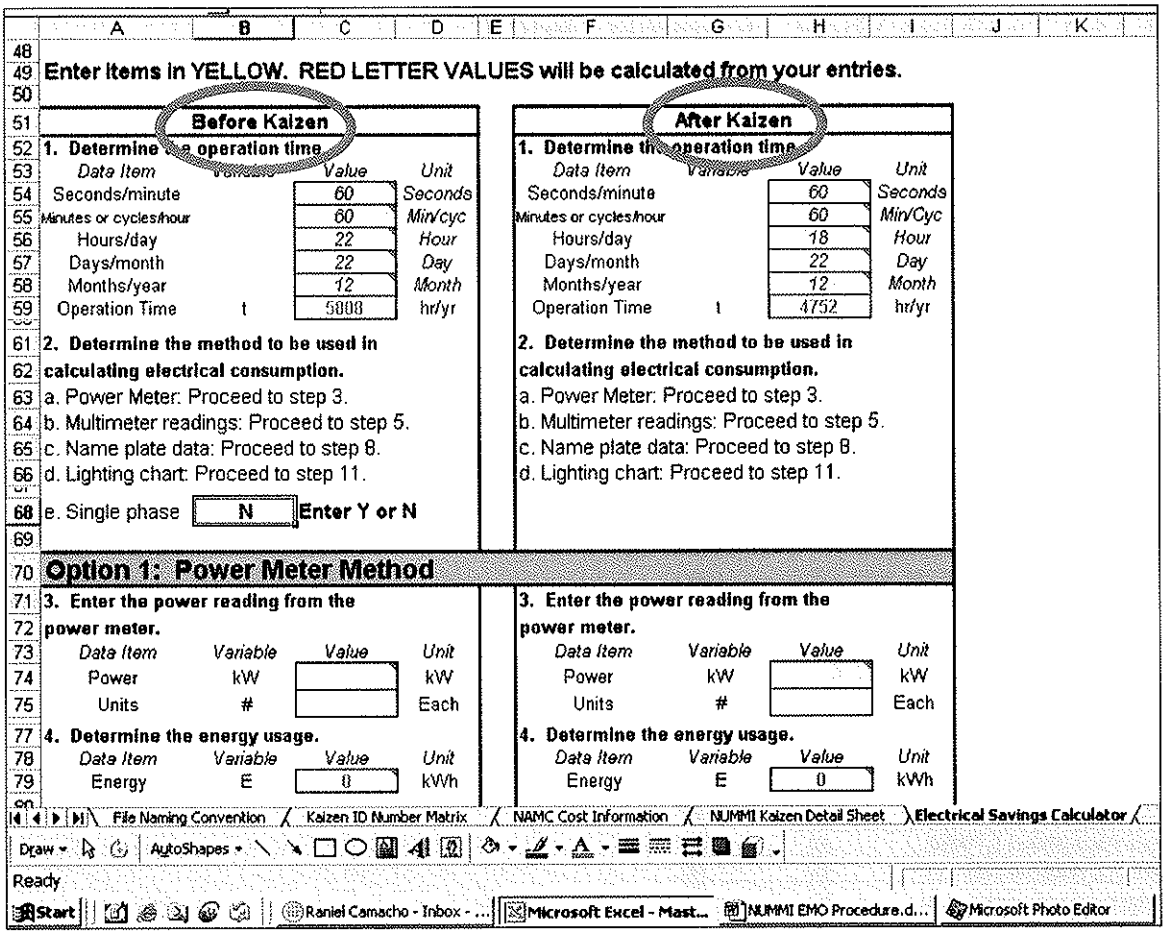
Completion Data and Implementation Notes: This section follows-up and shows the ***actual*** cost and savings of kaizen. This is completed before the detail sheet can be sent to TEMA and posted on the database.



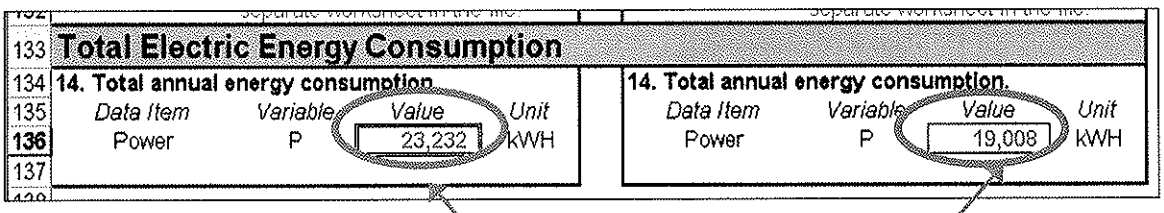
Calculator Tabs: There are various calculation tabs (separated by resource use) that determine the amount of energy savings through kaizen:

Electrical savings	Water savings
Lighting savings	Chilled Water savings
Natural Gas savings	Steam savings
Compressed Air savings	

Each tab has a "before kaizen" column and an "after kaizen" column that calculates resource use both before and after kaizen.



Then, it calculates the net difference between each column's results, and transfers the difference in the main detail sheet page.



Before Kaizen

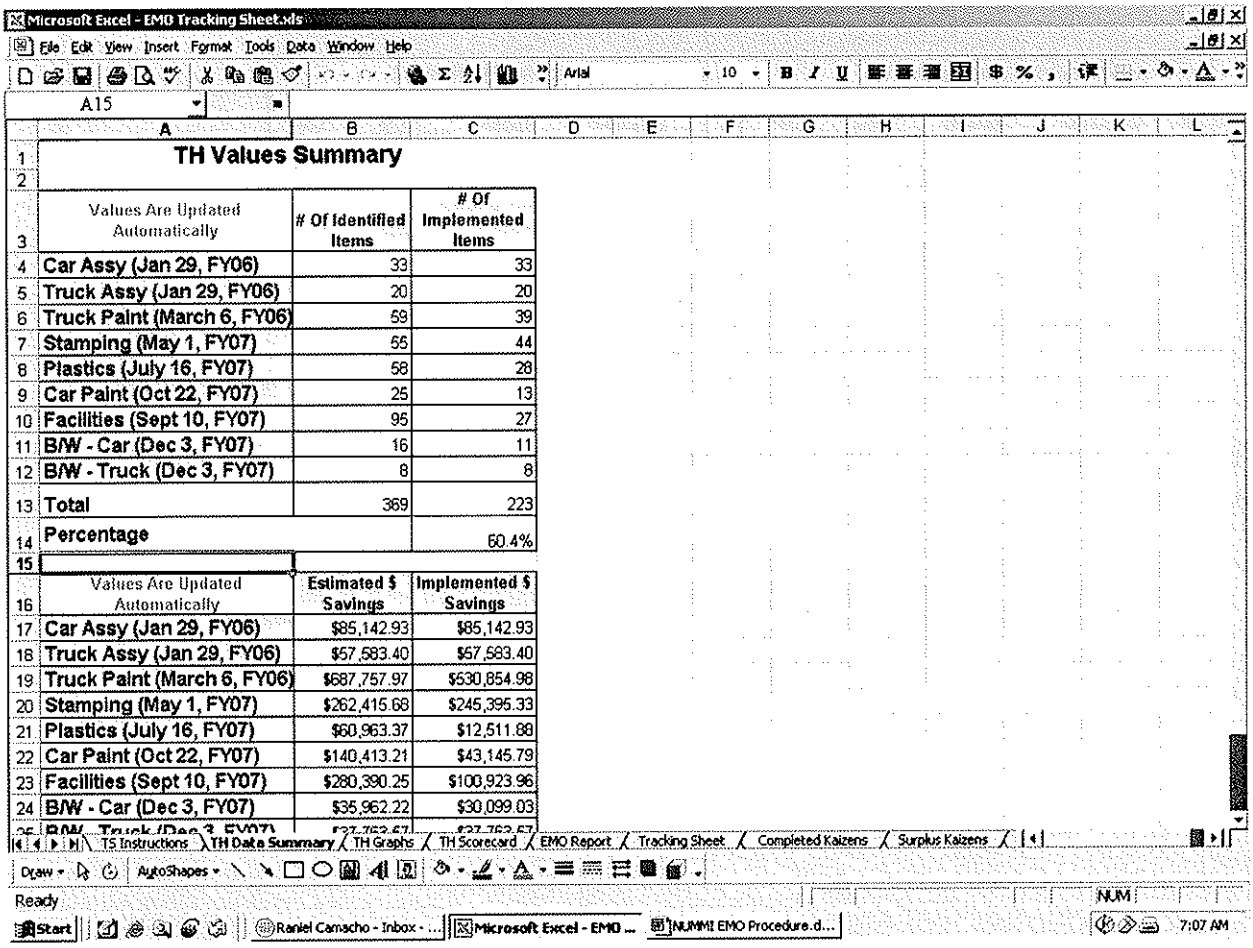
After Kaizen

2.2 EMO Tracking Sheet (Example Only)

The EMO Tracking Sheet is the main EMO tool used by all the shops. The EMO Tracking Sheet's fourteen (14) tabs are updated constantly and are used as a reference to monitor all kaizens. The EMO Tracking Sheet is located at:

1. ***TS Instructions.*** This explains each tab and its main function

2. ***TH Data Summary.*** This automatically counts the number of identified and implemented kaizens. Additionally, it automatically calculates the dollar amount of potential and implemented savings. The TH Data Summary calculates both values by looking for a "Y" in the "TH Item, Y/N?" column in both the Tracking Sheet and Completed Kaizens worksheets. If the column contains a "Y", then the TH Data Summary counts the item and its dollar amount.



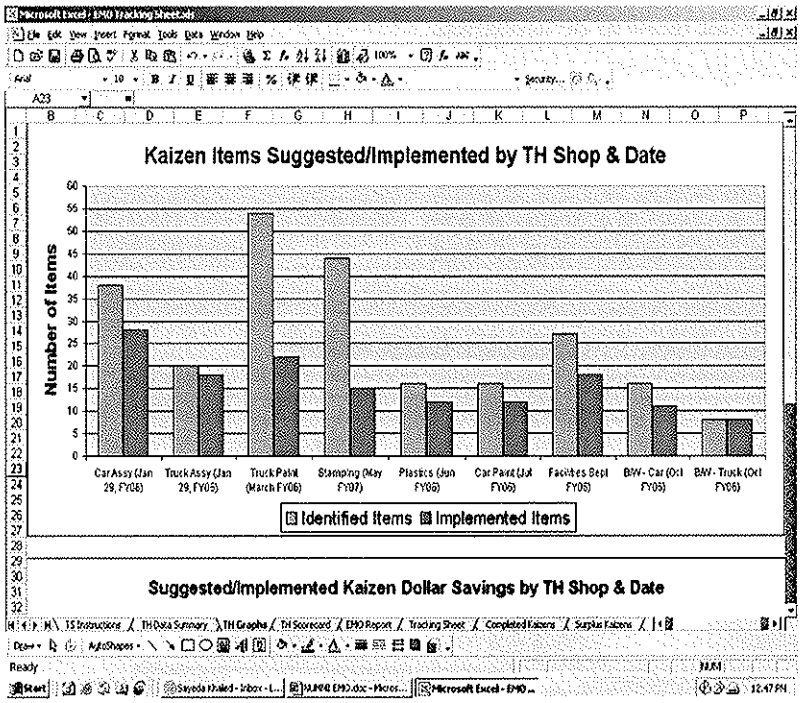
TH Values Summary

Values Are Updated Automatically	# Of Identified Items	# Of Implemented Items
Car Assy (Jan 29, FY06)	33	33
Truck Assy (Jan 29, FY06)	20	20
Truck Paint (March 6, FY06)	59	39
Stamping (May 1, FY07)	55	44
Plastics (July 16, FY07)	56	28
Car Paint (Oct 22, FY07)	25	13
Facilities (Sept 10, FY07)	95	27
B/W - Car (Dec 3, FY07)	16	11
B/W - Truck (Dec 3, FY07)	8	8
Total	369	223
Percentage		60.4%

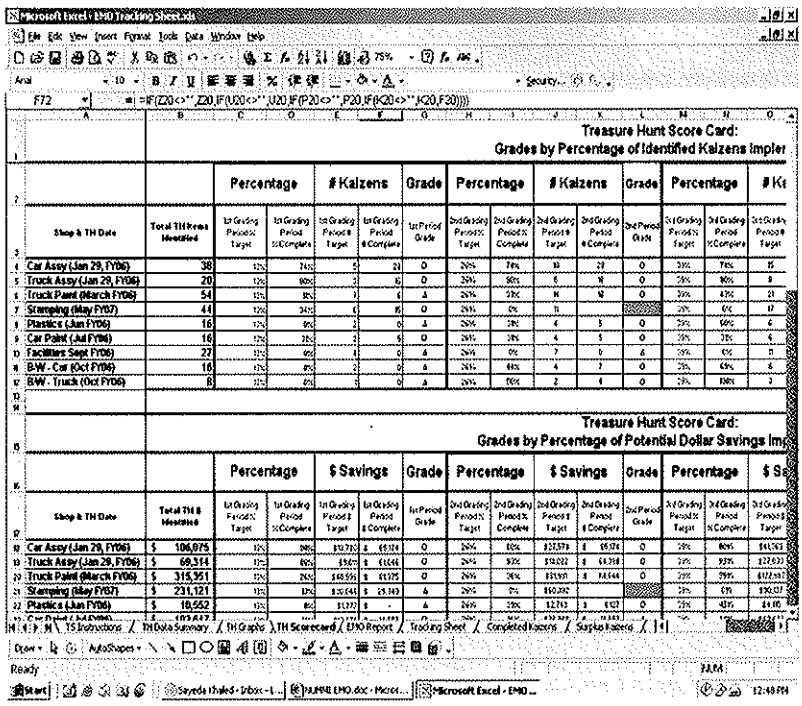
Values Are Updated Automatically	Estimated $ Savings	Implemented $ Savings
Car Assy (Jan 29, FY06)	$85,142.93	$85,142.93
Truck Assy (Jan 29, FY06)	$57,583.40	$57,583.40
Truck Paint (March 6, FY06)	$687,757.97	$530,854.98
Stamping (May 1, FY07)	$262,415.68	$245,395.33
Plastics (July 16, FY07)	$60,963.37	$12,511.88
Car Paint (Oct 22, FY07)	$140,413.21	$43,145.79
Facilities (Sept 10, FY07)	$280,390.25	$100,923.96
B/W - Car (Dec 3, FY07)	$35,962.22	$30,099.03

Note: Don't forget to manually update the Treasure Hunt date (in the 'TH Data Summary' tab) after the conclusion of each TH. This is an ongoing procedure to reflect the TH cycle.

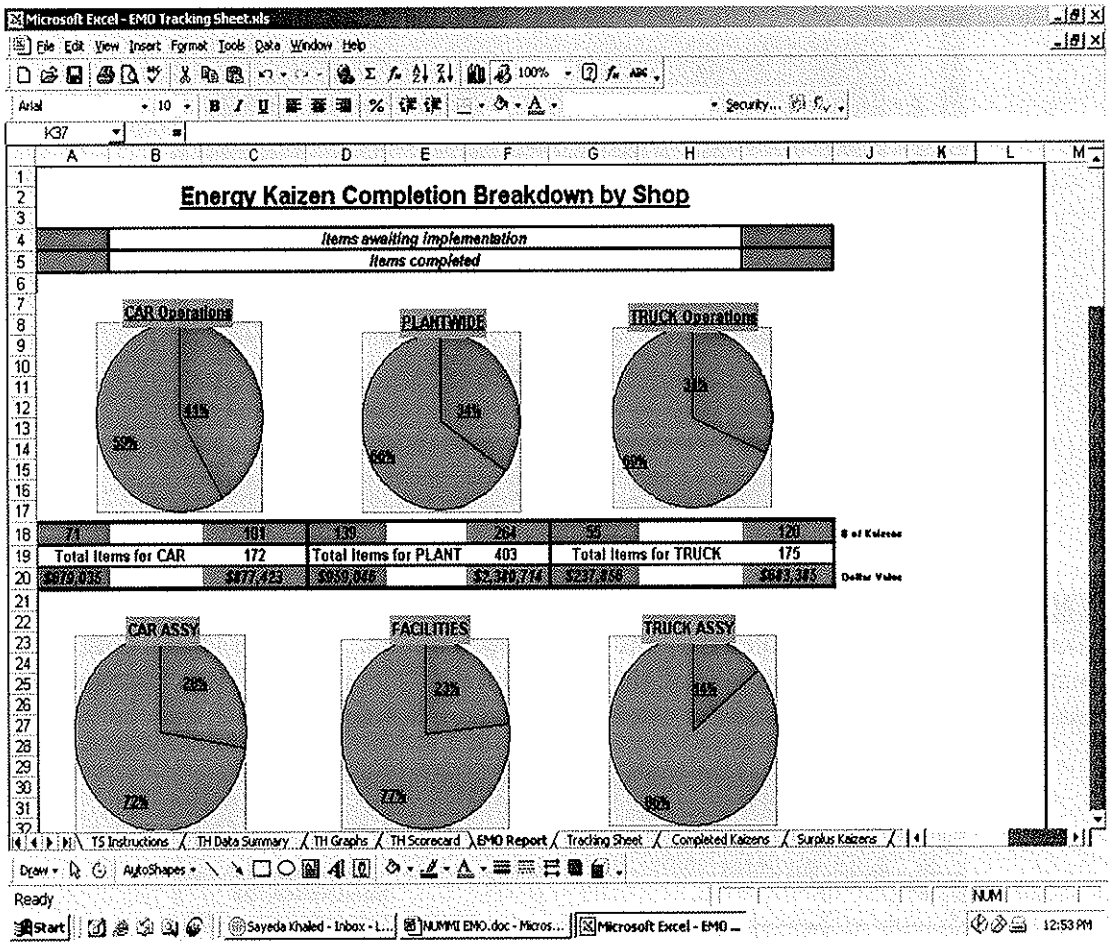
3. ***TH Graphs.*** This tab shows data from the TH Data Summary in bar graph form, which is automatically updated.



4. ***TH Scorecard.*** This is a major task that gives a grade for each shop's TH progress. The scorecard should be completed by the 15th of each month. The user inputs both the number of implemented items and their combined dollar amount. Then, the worksheet assigns a score by automatically calculating their percentages.



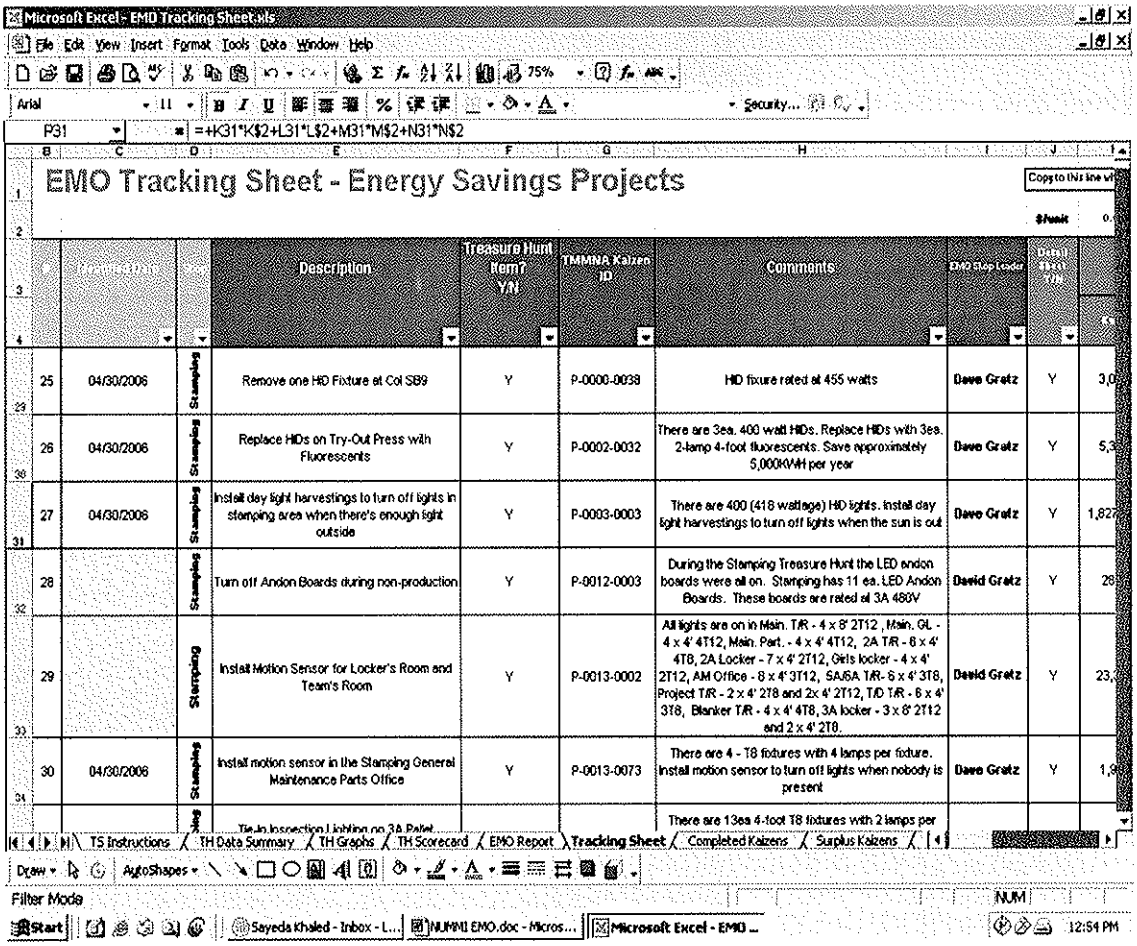
5. ***EMO Report.*** The EMO Report worksheet shows the TOTAL amount of Kaizens for each shop (Treasure Hunt and non- Treasure Hunt items). Here, each shop's Kaizens are broken down into completed and open items. The graphs and tables are automatically updated and do not need to be modified.



6. ***Tracking Sheet.*** This contains all "pending" kaizens from each shop (both TH and non-TH). Each row contains one Kaizen, and each column provides important information about that kaizen.

   The Tracking Sheet tab is the main input sheet after a Treasure Hunt. The values in this sheet should match the values in the summary tab.

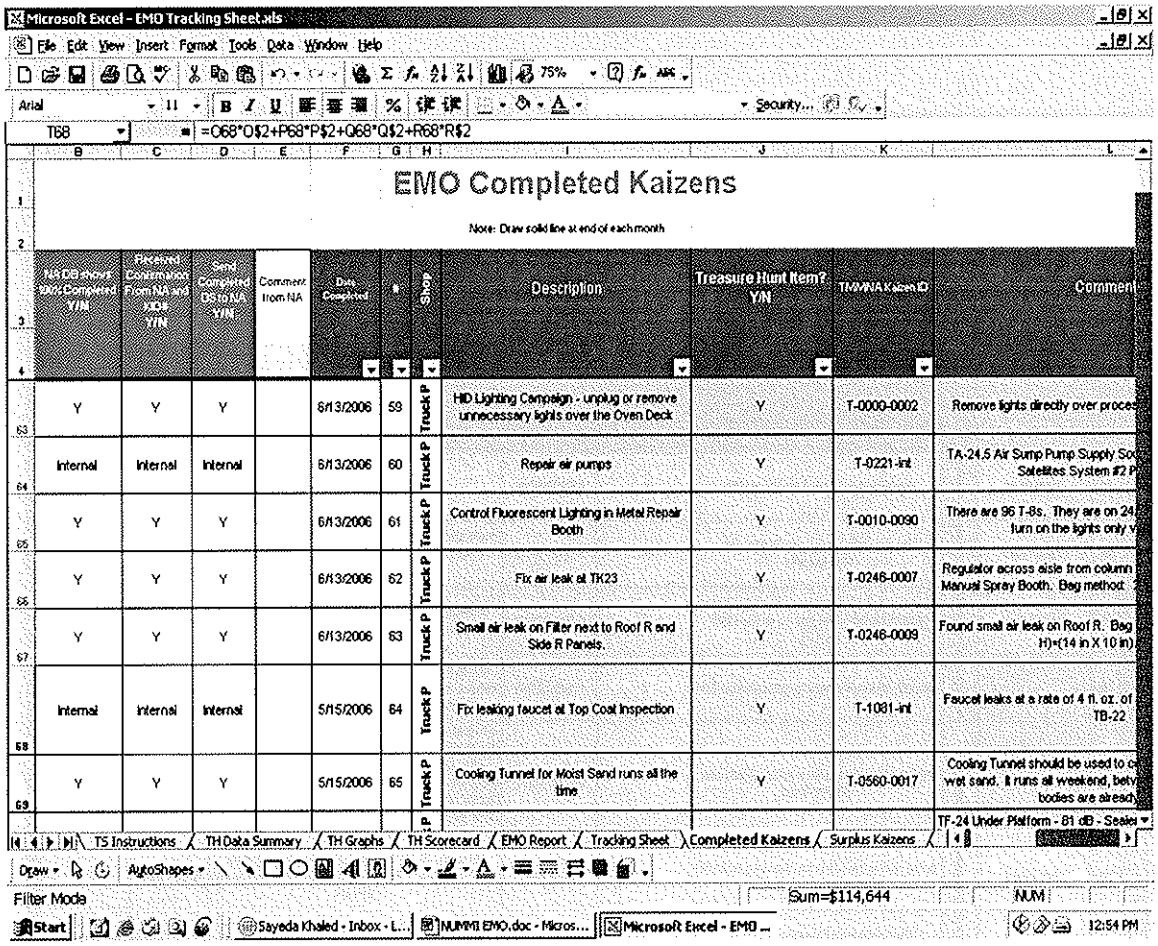
   In the column headings, small gray buttons in the lower right corner control Excel's AutoFilter function. When clicked, these buttons open menus that show different items in each column (e.g. clicking on the "Shop" button will display different shops that appear under that heading). If you select an item in the pull-down menu, the worksheet will only display kaizens that match the item (e.g., if you select "Stamping", only Stamping kaizens will be displayed). You can also enter your own search criteria by choosing "custom".



7. ***Completed Kaizens.*** This worksheet is similar to the Tracking Sheet worksheet, except it only shows completed kaizens (both TH and non-TH items). This sheet also shows the kaizen completion date and some columns that remind the EMO team to verify that TMMNA has recognized the kaizens' completion.

   Before the 1st grading period, the contents under the respective shop are moved to the FY End Reports file (see page 28).

   The Completed Kaizens worksheet also uses Excel's AutoFilter function to search for specific kaizens. To learn how to use AutoFilter, see the instructions on the Tracking Sheet worksheet page.



8. ***Surplus Kaizens:*** The Surplus Kaizens worksheet is a storage tab for past and present kaizens. It is similar to the Tracking Sheet, but holds kaizens deemed not feasible at that current time. These non-feasible kaizens are kept here for future use in case they become feasible to do later on.

9. ***TH Summary.*** This sheet provides a place to input all of the items found during a TH. It also serves as a blank template from which the user can create a summary report (e.g. to view all TH Kaizens on one sheet, both open and complete).

10. ***TH Procedure.*** This sheet contains instructions and procedures for a Treasure Hunt.

11. ***TH Write-Up.*** The TH Write-Up form is used during Treasure Hunts to document the details of a kaizen. (This is a template.)

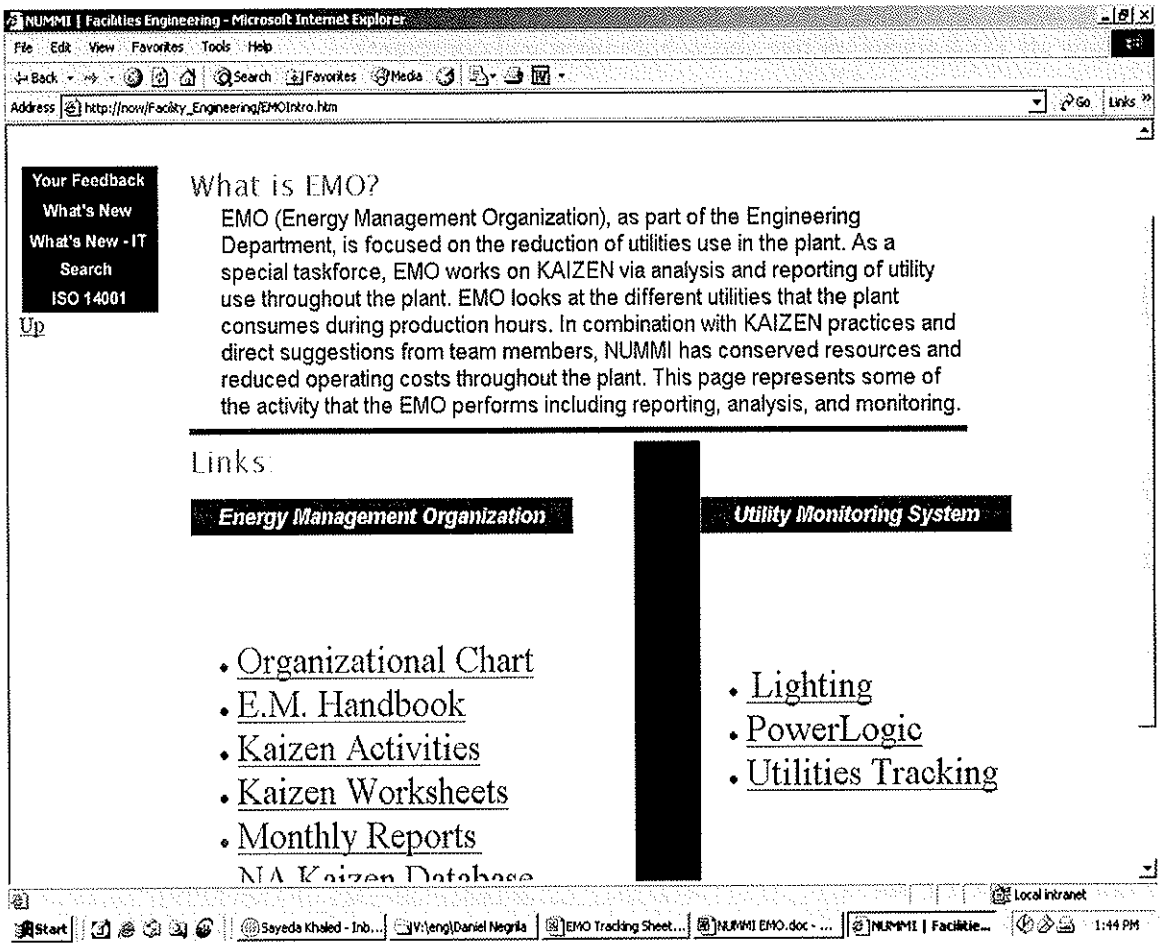
12. ***Non-Feasible Sign Off.*** This form is filled by the EMO shop leader to explain a non-feasible kaizen. The EMO Coordinator removes non-feasible items from the shop's list of Kaizens only if he/she receives this form signed by the shop's Engineering Manager. (This is a template.)

13. ***TH Agenda.*** The TH Agenda lays out each day's schedule and assignments for a TH.

14. ***TH Schedule.*** The TH Schedule contains the dates for each TH during the fiscal year. The TH schedule should be completed by the EMO Coordinator prior to the start of each fiscal year.

2.3 EMO Website (Example Only)

Go to this web page to get to the EMO website:
http://now/Facility_Engineering/EMOIntro.htm



The EMO website consists of two main sections: energy management resources, and utility monitoring

2.3.1 Energy Management Resources

This section of the EMO website provides information about:

- Organizational chart – shop representatives and support group.
- E.M. Handbook – this explains the different types of energies and how to measure them, NAMC's energy usage, how utilities are generated, how to successfully implement a kaizen, how to conserve energy, and how to calculate energy savings
- Kaizen Activities – this opens the EMO Tracking Sheet
- Kaizen Worksheets – the latest detail sheet
- Monthly Reports – contains utility billing and energy use/targets information
- NA Kaizen Database – link to the TEMA database

2.3.2 Utility Monitoring

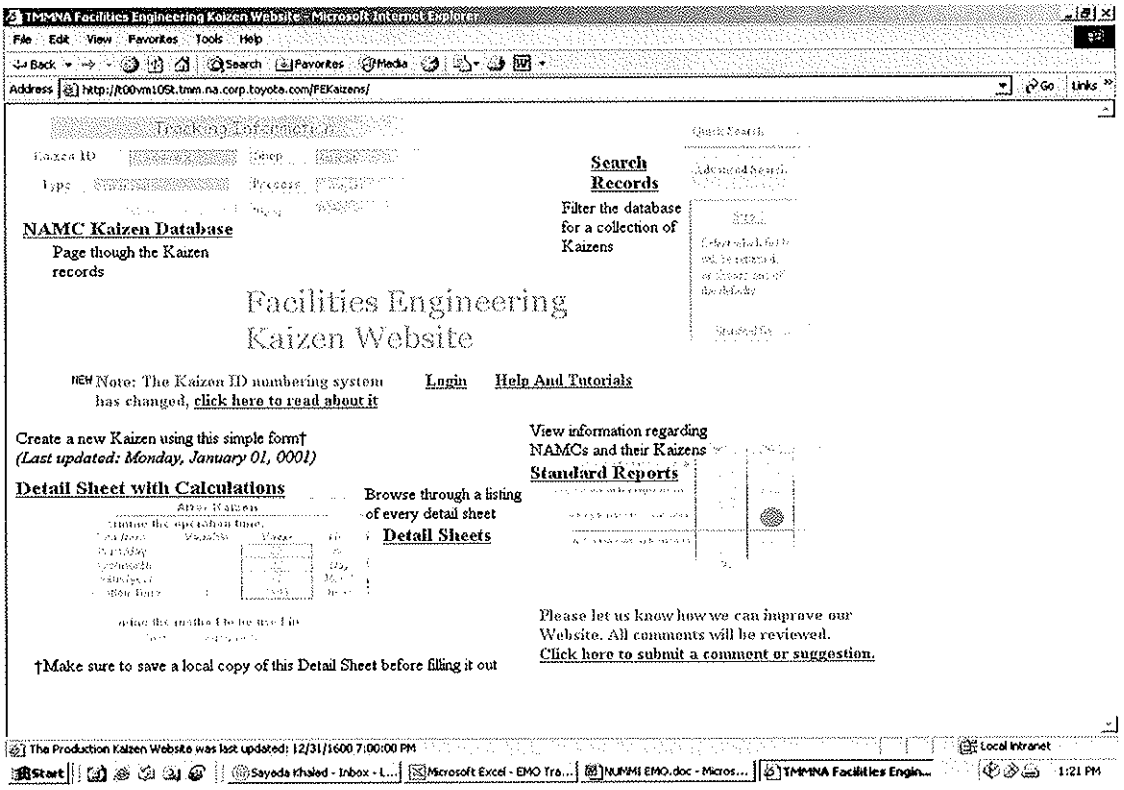
This section of the EMO website lets each shop track and monitor their own utility usage, using real-time energy trend data. It consists of 3 sections:

- Lighting – Powerlink program which controls the lighting panels operation schedule (needs a password to gain access)
- Power Logic – measures and tracks electrical power at each shop's substations (needs a password to gain access)
- Utility Tracking – shows real-time and historical data of each shop's water, gas, and compressed air usage (anyone can access this section without a password)

2.4 TEMA Kaizen Database

This tool was created by TEMA to keep track of all kaizens generated in North America (NA). It lists all the NA facilities, documents kaizen status, and can search for kaizens with or without the full kaizen ID (every kaizen is assigned a unique kaizen ID#). The NA database consists of:

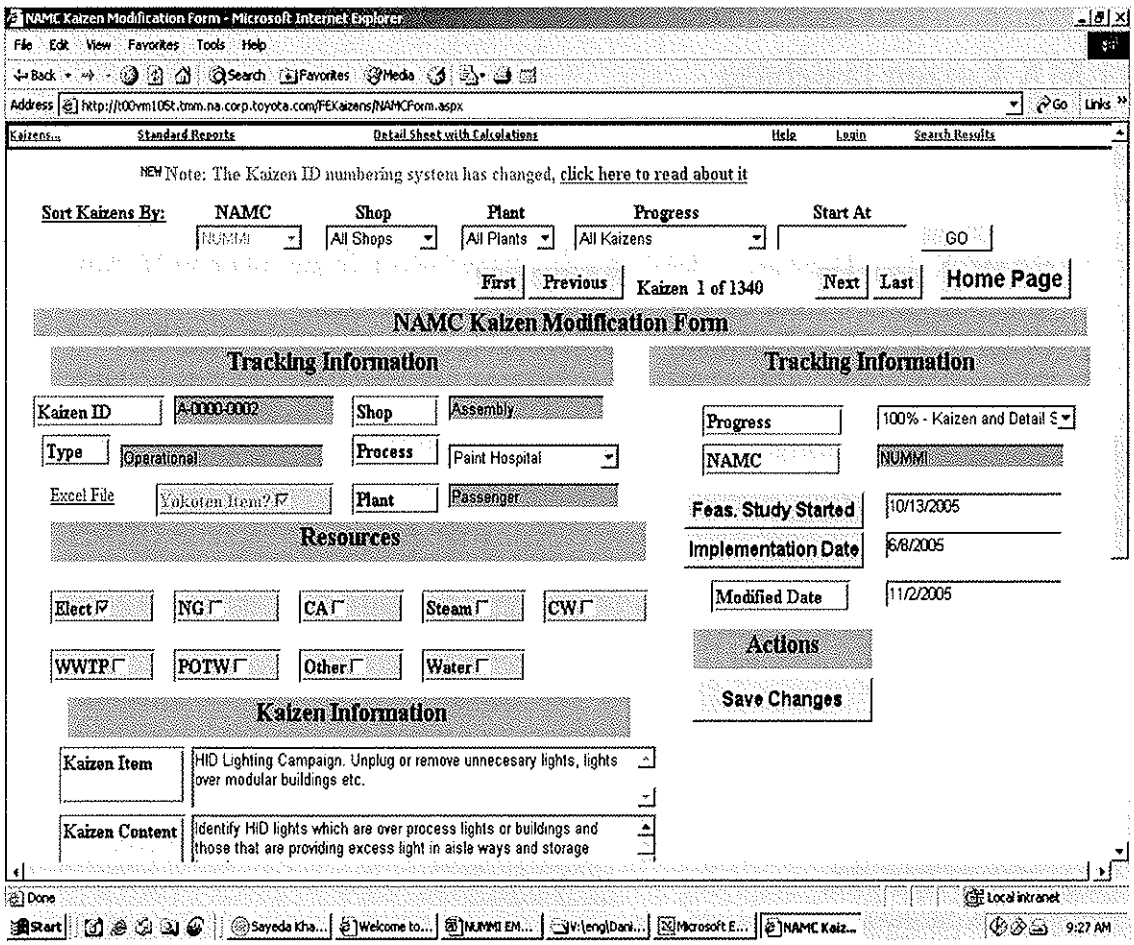
- NAMC Kaizen Database – detailed info of any kaizen in any plant in N. America
- Search Records – filter the database to find desired kaizens
- Detail Sheet with Calculations – downloadable copy of a detail sheet file
- Standard Reports – general info about kaizens in other plants, and their status



To search the TEMA Kaizen Database WITH a complete kaizen ID#:

A. Login
   a. Click on "Login" on the center of the page
   b. Enter "nummi" for user name and password
   c. If entered correctly, clicking 'SUBMIT' will direct you back to the homepage

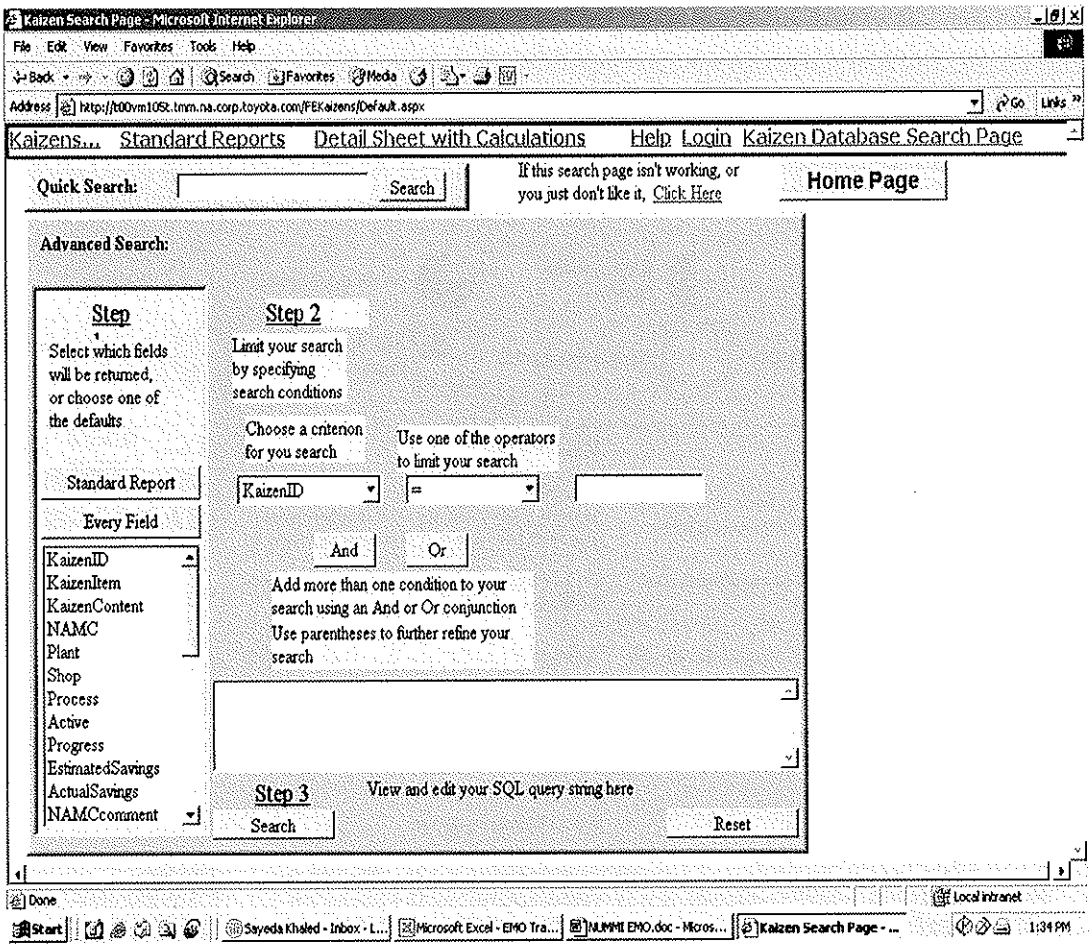
B. Search
   a. Click on "NAMC Kaizen Database"
   b. Enter kaizen ID number in the "Start At" box
   c. Click on "Go", DO NOT press the 'enter' key because it will not work



Note: You can update the status as well as change the content of existing kaizens on this page.

To search the TEMA Kaizen Database without the kaizen ID#:

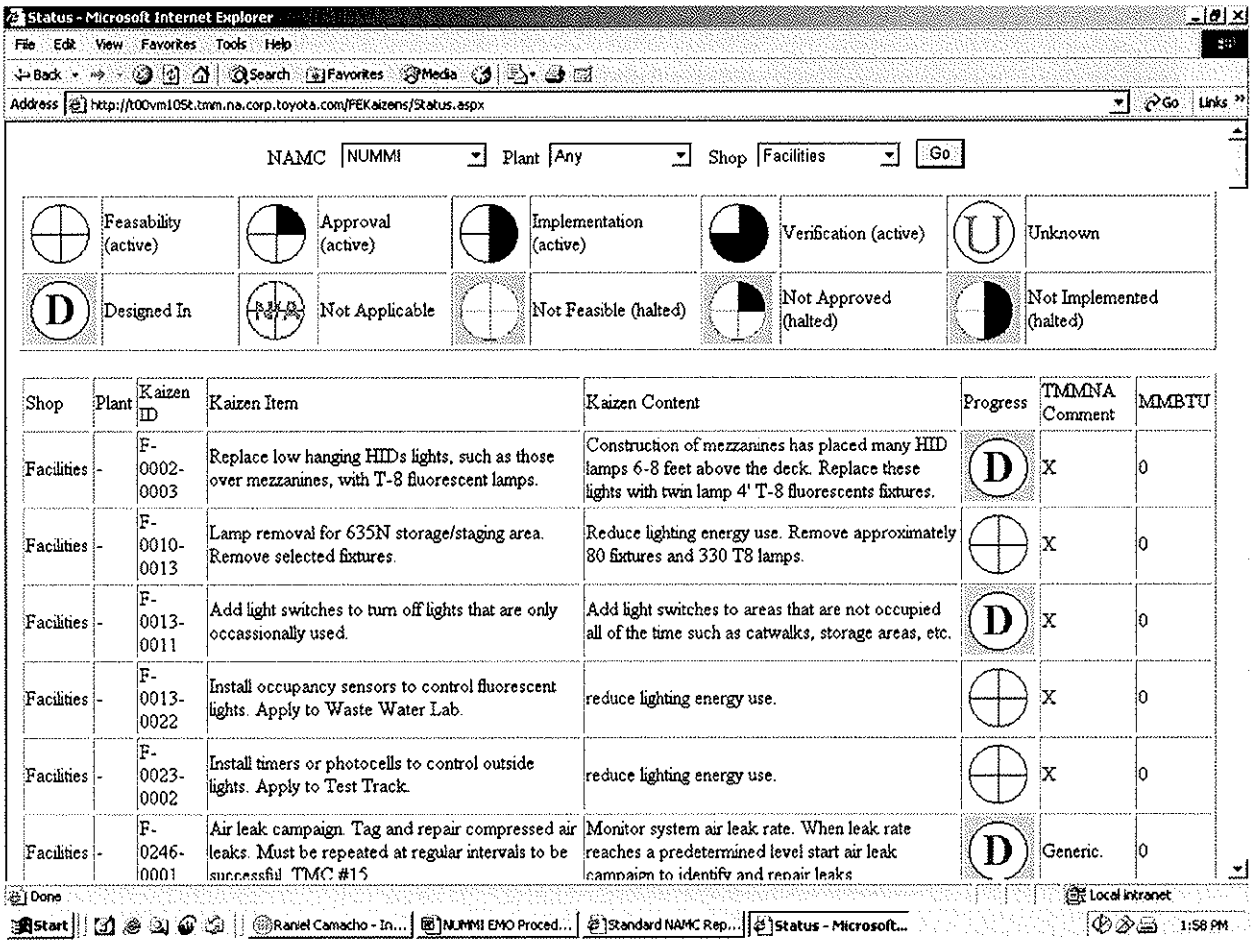
A. Login (see instructions on previous page)
B. Search
   a. Click on "Search Record" to get to the page below:



b. Use "Quick Search" to look for keywords OR…
c. Use "Advanced Search" option to list kaizens that meet particular criteria
    i. Select fields to see in the report (standard report works as well)
    ii. Set search conditions:
        1. To set more than one condition, click the "AND" and/ or "OR" buttons BETWEEN conditions
        2. Give the database plenty of time to load the conditions – rushing through will cause an error when setting conditions
        3. Click "Search" to list kaizens that meet the criteria
        4. Copy and paste report fields into Excel for further manipulation (This will require some formatting)

Standard Reports: This contains various reports on kaizens in North American Toyota plants.

The 'kaizen status' button opens a window that shows all NUMMI open kaizens in the database. We use this to revisit prior kaizens and update their status, as well as check on them during an upcoming treasure hunt.

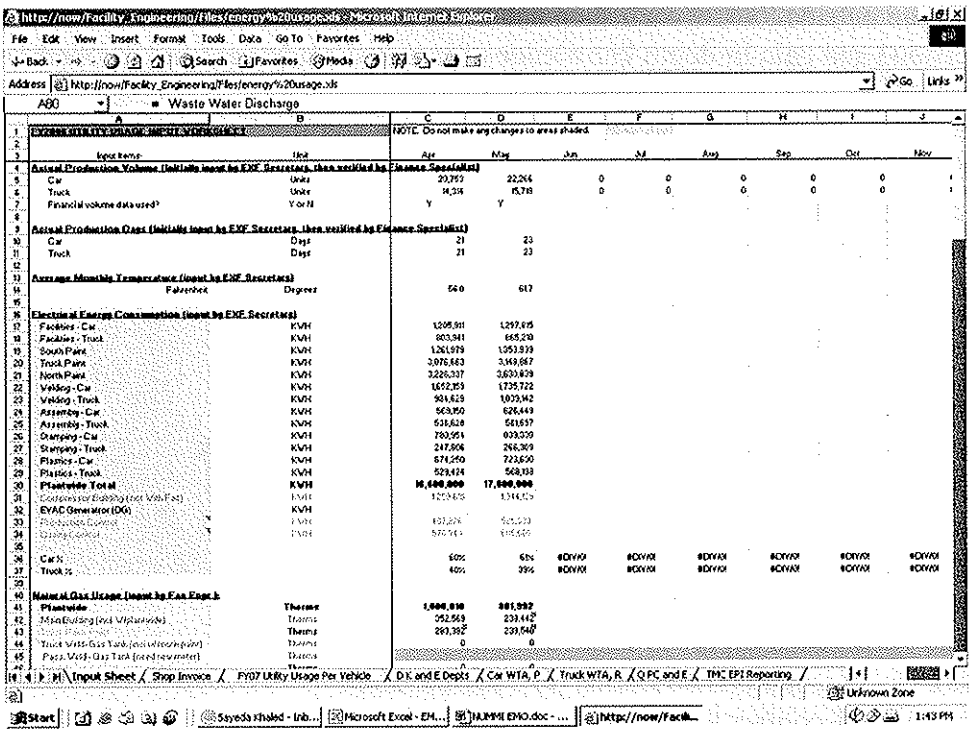


Shop	Plant	Kaizen ID	Kaizen Item	Kaizen Content	Progress	TMMNA Comment	MMBTU
Facilities	-	F-0002-0003	Replace low hanging HIDs lights, such as those over mezzanines, with T-8 fluorescent lamps.	Construction of mezzanines has placed many HID lamps 6-8 feet above the deck. Replace these lights with twin lamp 4' T-8 fluorescents fixtures.	D	X	0
Facilities	-	F-0010-0013	Lamp removal for 635N storage/staging area. Remove selected fixtures.	Reduce lighting energy use. Remove approximately 80 fixtures and 330 T8 lamps.		X	0
Facilities	-	F-0013-0011	Add light switches to turn off lights that are only occassionally used.	Add light switches to areas that are not occupied all of the time such as catwalks, storage areas, etc.	D	X	0
Facilities	-	F-0013-0022	Install occupancy sensors to control fluorescent lights. Apply to Waste Water Lab.	reduce lighting energy use.		X	0
Facilities	-	F-0023-0002	Install timers or photocells to control outside lights. Apply to Test Track.	reduce lighting energy use.		X	0
Facilities	-	F-0246-0001	Air leak campaign. Tag and repair compressed air leaks. Must be repeated at regular intervals to be successful. TMC #15	Monitor system air leak rate. When leak rate reaches a predetermined level start air leak campaign to identify and repair leaks.	D	Generic.	0

2.5 Energy Usage Matrix (Example Only)

To access the Energy Usage Matrix:

A. Go to ***http://now/***
B. Click on "Departments"
C. Click on "Facility Engineering"
D. Click on "Monthly Reports"



The Energy Usage Matrix is updated monthly and contains:

- Energy Usage graphs
- Utility billing
- Production volume
- Weather data
- Shop targets
- Utility budgets
- Production days

Note:

1. Additionally, target vs. actual usage graphs (in the Energy Usage Matrix) are shown in every Treasure Hunt Management Presentation.

2. Utility billing info from the energy usage matrix should be updated in the 'NAMC Cost Information" tab, located in the Detail Sheet.

3.0 Treasure Hunt

3.1 Purpose

- Identify unnecessary use of Energy (MUDA) in manufacturing and plant facilities
- Utilize the diverse experience of Team Members from various shops
- Provide an outside look at each shop and bring in fresh ideas
- Understand and gain in-depth knowledge of installed equipment and its operating conditions
- Support shop EMO Leader to effectively Prioritize and Implement Kaizens
- Develop new ideas for inclusion in the TEMA Energy Kaizen Database
- Drive the awareness for Energy Conservation
- Assist NUMMI in achieving its Energy reduction goals and objectives

3.2 Roles and Responsibilities

EMO Coordinator – Lead and Direct EMO Team

- Schedule Monthly Treasure Hunt Dates and send out Reminders
- Facilitate Treasure Hunt Activity according to Minutes
- Prepare Kaizen Detail Sheet Package for Host Shop
- Summarize Active and Pending Kaizens for Host Shop
- Train Team on Detail Sheets as Required
- Provide Technical Support to Team as Required
- Prepare Documentation and Forms for Treasure Hunt
- Act as point-of-contact for further help on complex Kaizens
- Report Monthly Progress of EMO Activities to Management and TEMA
- Keep Team informed of Targets and Energy related Initiatives
- Maintains EMO Website and Kaizen Database

Host Shop EMO Leader – Lead and Direct Shop Energy Team

- Schedule Meeting with Shop Management (Wednesday's) for Treasure Hunt Final Presentation (Summary of Results)
- Reserve Large Room for (Sunday, Monday & Tuesday)
- Present Summary of Final Treasure Hunt Results to Shop Management
- Provide PPE - other than safety shoes
- Act as Source of Information for Equipment and Kaizen Status
- Provide ***Layouts, Operating Schedules, Equipment Size, Usage Ratings, Capacities, # of Units, etc.*** at least One Week prior to Treasure Hunt for:
  - **Process Equipment** (i.e. Paint Booths, Conveyors)
  - **Facilities** (i.e. HVAC, Lighting)
  - **Utilities** (i.e. City Water, Steam, Compressed Air)
- Schedule one or more TM from Maintenance and Production from Host Shop

- Keep Shop Management abreast on Shop Status
- Provide input to management to Prioritize, Assign, Budget and Implement Kaizen opportunities
- Develop Action Plan for New Kaizens
- Report Shop Progress to EMO Coordinator on Monthly Basis
- Update Shop status on NA Kaizen Database
- Prepare follow-up Report for Shop Manager to report during next TH Final Presentation Meeting

All EMO Shop Leaders – Lead and Direct respective Shop's Energy Initiatives

- Participate in every Treasure Hunt
- Schedule one or more T/M from Maintenance and Production for Host Shop
- Keep Shop Management abreast on Shop Status
- Provide input to management to Prioritize, Assign, Budget and Implement kaizen opportunities for Shop
- Report shop Progress to EMO Coordinator on Monthly Basis
- Update Shop status on NA Kaizen Database

3.3 Methodology

A Treasure Hunt lasts three days and allows the participants to view the Shop processes and equipment during weekend non-production time, start up, production time, lunch and breaks. The time frame covered permits the Treasure Hunt Team see the Shop during all stages of equipment readiness.

Sunday 12PM – 4PM

- Kickoff meeting, safety talk, introductions
- Review Shop/s Active Kaizens from EMO Tracking Sheet
- Members review the use of Detail Sheet and Calculators
- Divide into groups and audit shop
- Summary Meeting where Data is collected for Detail Sheet generation

Monday 5:30AM – 12PM

- Observe Shop Start-up Activities
- Collect Data for Detail Sheet generation
- Observe Lunchtime Activity
- Complete Detail Sheets

Wednesday 7AM – 10AM

- Write-up Shop Summary Sheet
- Shop EMO Leader Presents findings to Shop Management
- Previous Shop Manager Presents Follow-up Report

3.4 Follow-Up

Follow-up with Kaizen Detail Sheet Implementation:

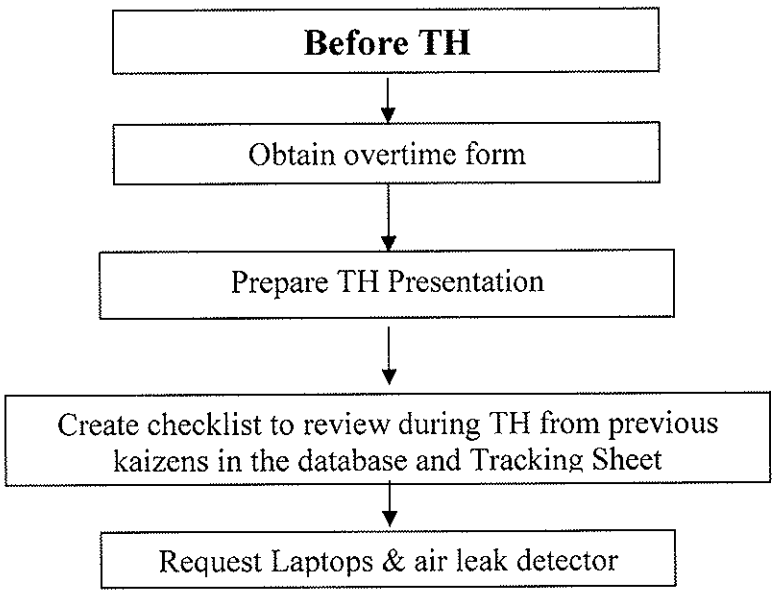
1. Detail Sheets must be turned in by the 15th of the month to include into previous month's report
2. Detail Sheets turned in after the 15th will count towards next month's activity
3. Detail sheets must be submitted in electronic format to the EMO Coordinator
4. EMO Coordinator will consult EMO Shop Leader about Detail Sheets that require more information

Each month, management will be presented with an EMO Scorecard Progress Report that will be shown at each Engineering Steering Committee meeting.

3.5 Pre-Treasure Hunt

Tasks performed prior to start of a TH:

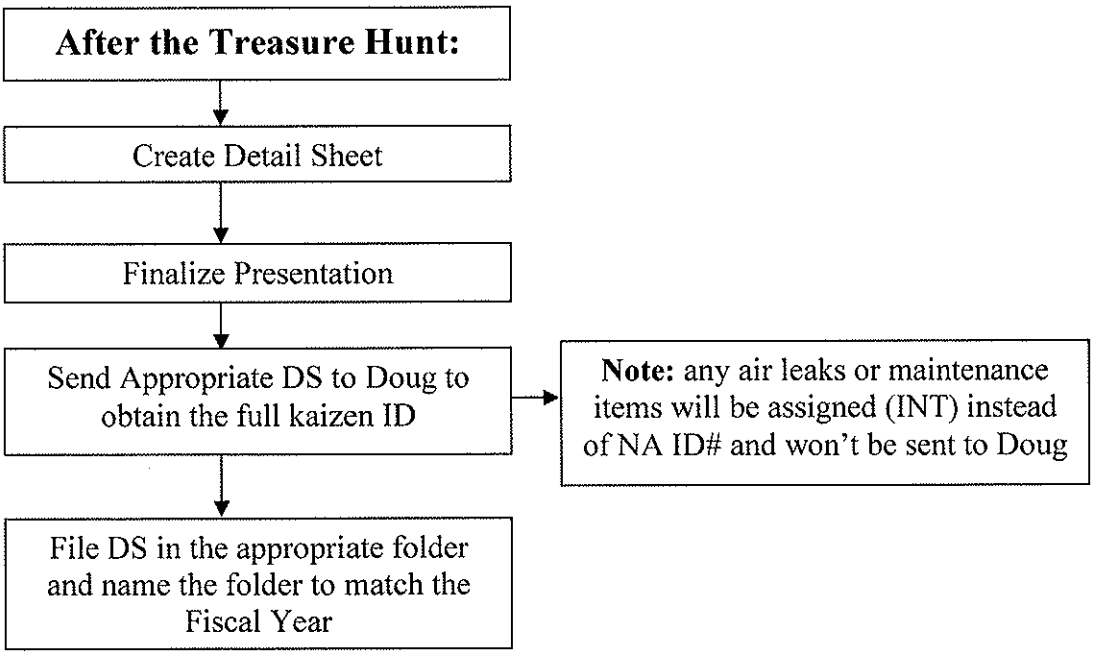
1. Prepare agenda with TH Procedure on back
2. Send TH email reminder
3. Get lunch tickets
4. Request laptops & air leak detectors (Paul Goyette)
5. Overtime Form (signed by Abe)
6. Print out sign-in sheet (3-days)
7. Print out copies of the write-up sheet
8. Review NA DB kaizen status report & Tracking Sheet items
9. Prepare power point presentation
10. Request updates from shops to revise Status Reports (send email)



3.6 Post Treasure Hunt

Tasks performed after conclusion of a Treasure Hunt:

1. Create DS for each finding.
2. Create a row entry for each DS in the EMO Tracking Sheet.
   - In the column "TH item Y/N", enter "T" (for Temporary. We use "T" to not affect the shop's current grade until their 1st grading period begins).
   - When the shop's first grading period starts, change all the T's to Y's to show those kaizens as TH items.
3. Finalize the TH power point presentation with the new findings. The TH presentations are located in: ***V/eng/Daniel Negrila/TH Presentations.***
4. Post the new TH DS by going to: ***V/eng/Daniel Negrila/EMO/Detail Sheets/Internal Treasure Hunt DS*** and choosing the appropriate folder for the shop.
5. Move all new DS files, along with the previous year's uncompleted DS, into a month and fiscal year dated folder.
6. Before Sending the new TH DS to Doug Estep, perform the following
   - Review the NA DB kaizen status report and check if we can recycle ID#s with similar kaizen instructions (we do this by modifying kaizen content in the database).
   - Any air leak DS or maintenance related kaizens would be kept internally and will not be sent to Doug. Those DS would be assigned 'INT' (INTernal) instead of the sequential #s that are assigned by Doug (example R-1234-INT).
   - Make sure kaizens with a full ID are posted in the database.
7. (IMPORTANT: Do this step AFTER the start of the shop's 1st grading period to avoid skewing their grade.) Transfer completed kaizens from the EMO Tracking Sheet to the "FYxx TH Report" (located at ***V/Eng/Daniel Negrila/EMO/End of Year FY TH Reports*).** The item completion date will tell which Fiscal Year Report the kaizen will go into (see page 28).



4.0 Scorecard

The TH Scorecard, located in the Tracking Sheet file, gives each shop a grade based on kaizen implementation and cost savings status. The first month after a TH is a grace period, then the shop will be graded for the next 5 months. After a completed month, any completed kaizens would be accredited to that month. Please refer to the instructions at the bottom of the Scorecard for the grading criteria.

The tracking sheet is located at: ***V/eng/Daniel Negrila/ EMO/ EMO Tracking Sheet.xls***

The scorecard should be updated by the 15th of each month. To ensure accuracy, please check the following:

- Verify that the number of kaizens completed AND the number of dollars saved matches are the same in both the "Completed Kaizens" tab and in the "TH Scorecard" tab.
    a. Use the "AutoFilter" function (the gray pull-down arrows under each column heading) to filter out kaizens, except those in a specific shop. (Isolating shops will make counting numbers for each shop a lot easier.)
    b. Count the number of completed kaizens in this tab, and make sure it is the same number recorded in the scorecard.
    c. Calculate the amount of dollars saved from all the completed kaizens, and make sure it is the same number recorded in the scorecard.
    d. Repeat for all shops.
- Go to the "TH Graphs" tab and verify all the data is the same as in the scorecard.

5.0 EMO Documentation

5.1 Step 1: Procedure on Processing (Recording) a Detail Sheet

1. If kaizen is complete, go to Step 2: Detail Sheet Follow-up Procedure
2. If kaizen is **Not Complete,** do the following:
    a. Make sure the filename is understandable (see Appendix A on how to create a filename) and serves as a quick reference for the kaizen.
    b. If kaizen is a TH item, post DS file in ***V:\Eng\Daniel Negrila\EMO\Detail Sheets\Internal Treasure Hunt DS*** (make sure it is placed in the appropriate fiscal year and shop folder)

c. If kaizen is a non-TH item, post the DS in ***V:\Eng\Daniel Negrila\EMO\Detail Sheets\Other DS***

d. Post DS info in the EMO Tracking Sheet (look at Step 3: Update Tracking Sheet Information)

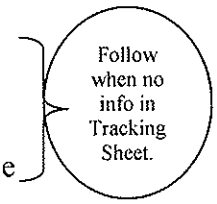
5.2 Step 2: Detail Sheet Follow-Up Procedure

1. Make sure the filename is understandable and serves as a quick reference for the kaizen (See Appendix A on how to create a filename).
2. Make sure the "Completion Data (Implementation Review)" section is filled out.
   a. If the numbers look similar to the estimated savings, call the originator to verify it is measured data.
   b. If information is not available, call originator to have their maintenance personnel measure the data (*DO NOT perform the measurement yourself*)
3. Make sure "Originating Location" section is complete.

5.3 Step 3: Updating Completed Detail Sheet Info in Tracking Sheet

1. Go to the EMO Tracking Sheet (located in ***V:\eng\Daniel Negrila\EMO***)
2. First, take notice of the number of open vs. complete kaizens, as well as the dollar amount open vs. complete from the pie chart (located in the "EMO Report" tab)
3. Go to the "Tracking Sheet" tab:
   a. Filter the column headings to check if the DS info exists (if not, go to part c)
   b. If the DS info is complete, transfer the completed item from the "Tracking Sheet" tab (incomplete kaizens) to the "Completed Kaizens" tab (completed kaizens)
      i. Copy and cut the kaizen in the "Tracking Sheet" tab, taking all info about it from the shop in question to the natural gas annual savings (NG mmBtu)
      ii. Insert a new row ABOVE THE FIRST ENTRY of the appropriate shop (in the "Completed Kaizens" tab. The newest entries are always at the top of their shop's list)
      iii. Paste the information from the 'Tracking Sheet' tab into the new row in the "Completed Kaizens" tab

c. If the DS has no info in the "Tracking Sheet" tab, do the following:
   i. Click on the "Completed Kaizens" tab and find specified shop
   ii. Insert a blank row and input the necessary info from the Detail Sheet file



4. Insert the kaizen completion date, the kaizen number, and the three boxes relating to NA (fill out the NA boxes after confirmation in the database.)
5. Link the dollar savings from the "Completed Kaizens" tab to the "TH Scorecard" tab as well as all the other data tabs in the Tracking Sheet file. To do this, go to the *'value of completed items'* section (the **GREEN** section in "Completed Kaizens", in the far right) and select the appropriate shop cell
   a. Link the *'$ Savings/yr'* cell to the *'value of completed items'* cell by inputting into the **GREEN** cell a '=' sign followed by the *'$ Savings/yr'* cell for the kaizen. (ex: input into the **GREEN** cell → "=(cell letter)(cell number)")
   b. You should see the same dollar amount for the *'$ Savings/yr'* cell and the *'value of completed items'* cell
6. After all of this is completed, there should be an increase of **COMPLETED** kaizens and a reduction of OPEN kaizens for that shop shown in the "EMO Report" tab

5.4 Step 4: Transfer DS File to "Completed DS" Folder

1. Find the newly completed kaizen detail sheet, located somewhere in the "Internal TH" folder
2. Transfer the file into the "Completed DS" folder, under the correct fiscal year and shop, located in: ***V:\ENG\Daniel Negrila\EMO\Detail Sheets\Completed DS***
3. If the NA Database shows that the kaizen is at 100%, place the file in the month when the Kaizen was completed (if such a folder does not exist, create one)
4. If the NA Database shows that the kaizen is NOT at 100%, place the file inside the shop folder, but NOT in any particular month. Move the DS into the appropriate month folder once NA confirms completion and the Database shows 100%
5. Print a hardcopy and place it in the "Shop Detail Sheets 20xx" binder, under the correct fiscal year (for hardcopy backup purposes)

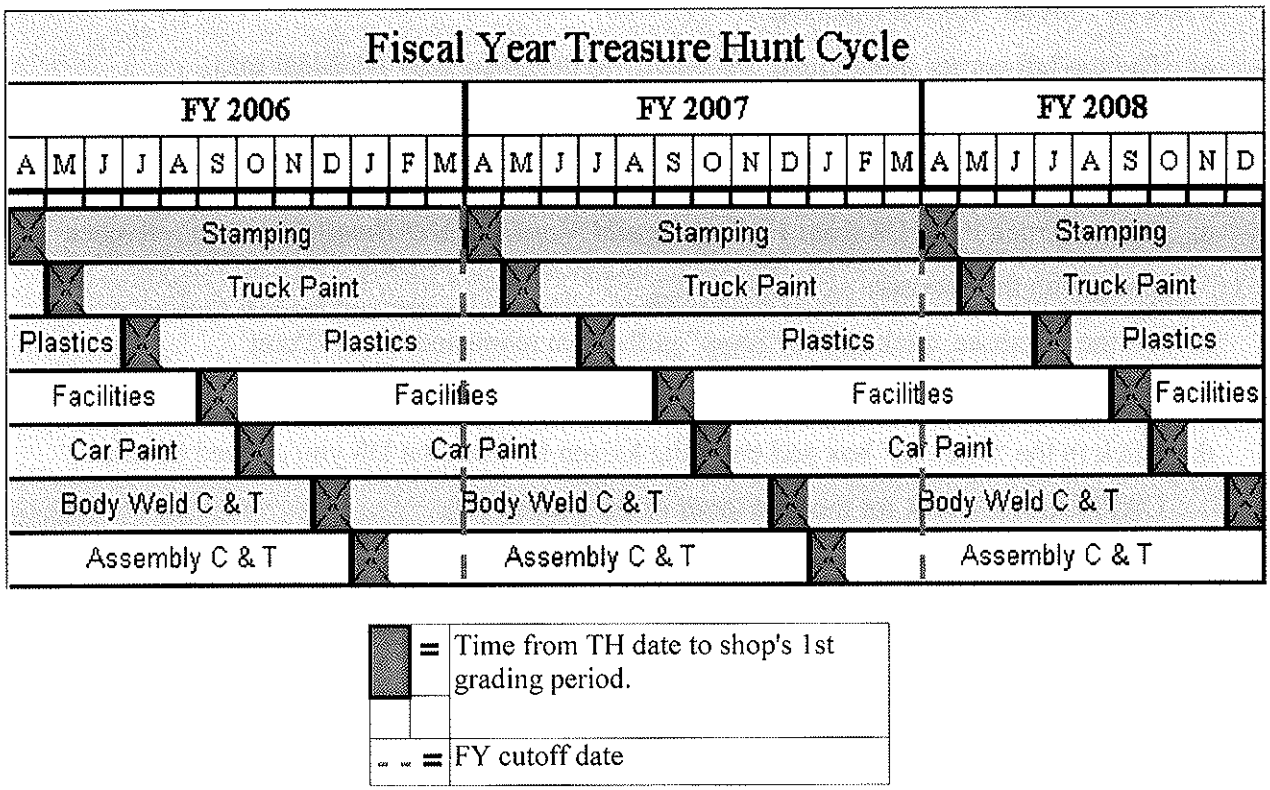
5.5 Step 5: Posting/Updating NA Kaizen Database

1. If you don't have a Kaizen ID for the DS, then do the following:
   a. Try to **recycle** an existing Kaizen ID # from the NA Database
      i. The Kaizen ID must match the item description according to the naming convention in Appendix A
      ii. If the ID can be recycled, alter the kaizen description (but not the filename) on the NA Database **BEFORE** emailing the DS to Doug Estep
   b. If Kaizen ID cannot be recycled, email the DS to Doug Estep for a kaizen ID
2. Login using "nummi" as the User ID and Password
3. Click on 'NAMC Kaizen Database'.
   a. The top left corner should read "NUMMI" to designate only NUMMI info.
   b. Pull-down menus at the top of the page can filter out unwanted info.
4. *As an exercise, search for a Truck Paint Kaizen to see if the DS exists in the NA database:*
   a. Open a Truck Paint DS from ***V:\Eng\Daniel Negrila\EMO\Detail Sheets*** to reference along with the database
   b. On the Database, click on the "Shop" pull-down menu and select 'Paint'
   c. Click on the "Plant" menu and select 'Truck'
   d. Click in the "Start At" box and enter the kaizen ID from the DS you opened (Use a CAPITAL LETTER for the first letter of the Kaizen ID)
   e. Click on 'GO' to search. DO NOT PRESS ENTER.
5. If the Kaizen ID exists, you should see the ID displayed in the 'Tracking Information' on the left.
   a. Make sure the info on the database matches the DS (title, description, resources used, estimated savings, etc.) Always click "Save Changes" when you update the database
   b. If DS exists in the database, click on the file link to open the DS to make sure the files match under NUMMI. If there is no link, send a copy of the updated DS to Doug Estep.

5.6 Step 6: Annual TH Findings Transfer

Each shop's Treasure Hunt findings are monitored for 12 months (the TH cycle). This cycle usually falls between two fiscal years (see chart below). Before the start of each shop's 1st grading period, the **COMPLETED** TH items must be moved to the corresponding "FY End Reports" (based on the completion date of each completed item) to prevent creating inflated numbers in the Tracking Sheet.

If a TH occurs before the 15th of the month, then a shop's 1st grading period would begin the following month on the 15th. If a TH occurs after the 15th of the month, then their 1st grading period would begin two months later, on the 15th. All previous TH scores must be transferred JUST BEFORE their 1st grading period scores are released. Depending on their completion date, all previous TH items would go into one of three places: the Tracking Sheet, the previous year's FY Report, or the current year's FY Report. To clarify, follow the chart and example below:



(Ex: TH item transfer for Facilities (lets say their TH occurred on Sept. 1, 2006))

- All TH items completed after Sept. 1st → stay in the 'Completed Kaizens' tab in the Tracking Sheet.
- All TH items completed before Sept 1st → place into the FY07 Report.
- All TH items completed before April 2006 → place into the FY06 Report.

- **As soon as a FY06 Report is closed, immediately create a FY08 report.**

6.0 EMO Working Computer Drives

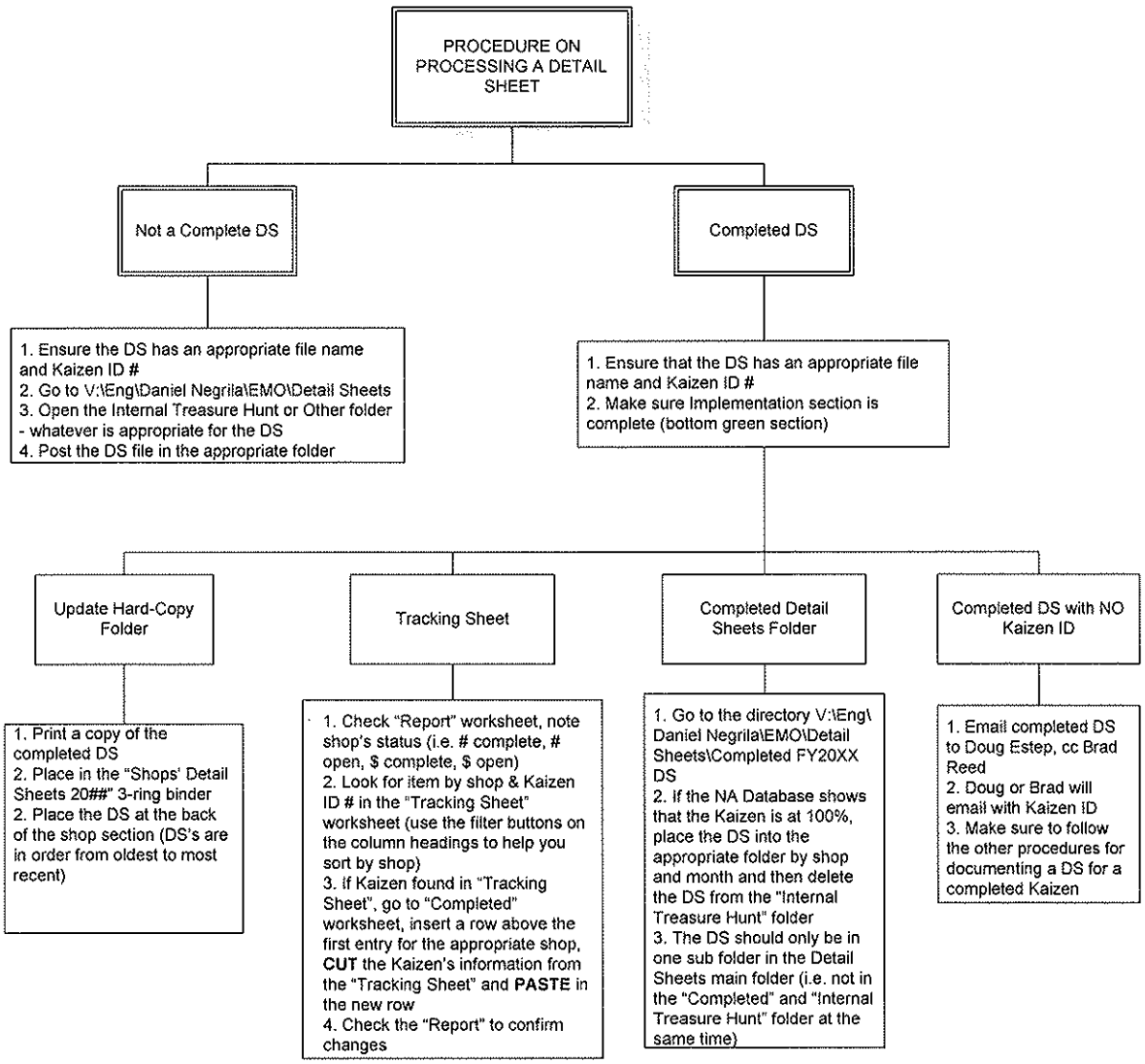
6.1 V-Drive

The V-Drive is a working drive between a co-op and their supervisor. All files and folders worked on in this drive should be backed up on a personal hard drive. The latest version of a file is made on the V-Drive to prevent duplication and confusion.

6.2 Z-Drive

The Z-Drive is the drive where work is posted for others to see. Files on the Z-Drive should be copies of real files on the V-Drive, and overridden when modified.

7.0 Quick-Reference for Detail Sheet Documentation



8.0 Co-op Summary List

1. Update Z-Drive whenever changes are made. All managers and EMO Shop Leaders can see their EMO progress on the Z-Drive, so the EMO Tracking Sheet on the Z-Drive should be as up to date as possible.

2. Update detail sheet billing rates (water, compressed air, electricity, etc.). Keep the rates of resources updated because their monetary value will affect prices in detail sheets and the EMO Tracking Sheet.

3. Update TH Scorecard by the 15th of each month.

4. Prepare Treasure Hunt Presentation on the week before each Treasure Hunt.

Agenda
Company Energy Use and Water Use
Car Operations (electricity, water, and natural gas)
Truck Operations (electricity, water, and natural gas)
NA Productivity Report
Treasure Hunt Scorecard
Previous Treasure Hunt Follow-Up
Current Treasure Hunt Findings

} Treasure Hunt Presentation Contents (see samples on V drive)

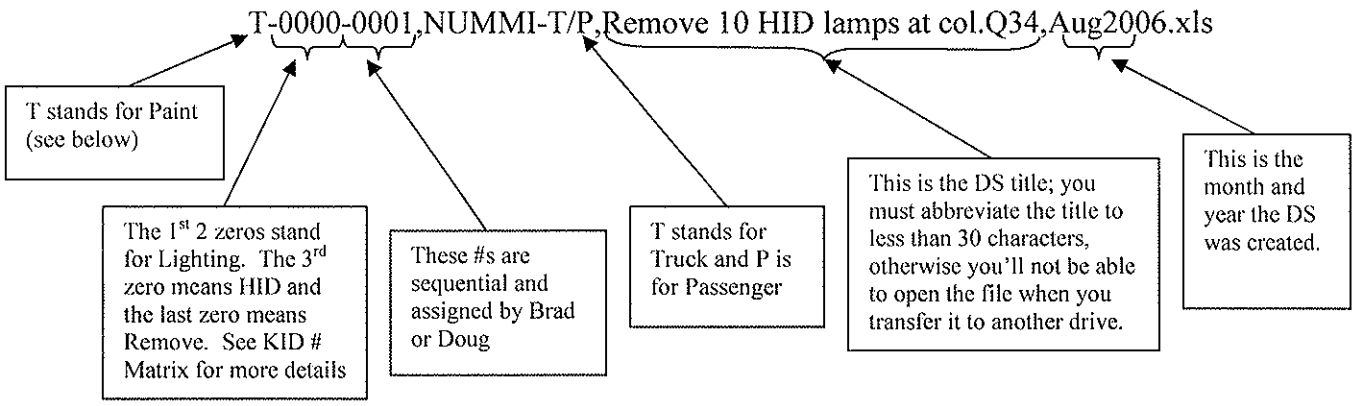
5. Print out the Shop Report from NA Database before Treasure Hunt to review with shop.

6. Document any completed kaizens turned in by shops, and update EMO Tracking Sheet file.

7. After Treasure Hunt:
   - ❑ Obtain kaizen ID numbers
   - ❑ File detail sheets in appropriate folder by shop and fiscal year
   - ❑ Update EMO Tracking Sheet
   - ❑ Transfer completed detail sheet inputs from Tracking Sheet to the "End of FYxx Report" file (before 1st grading period begins)

8. After detail sheet has been completed, and shown as 100% in the database:
   - ❑ Print a hardcopy and file in Shops Detail Sheet FYxx binder
   - ❑ Check status on NA database
   - ❑ Update EMO Tracking Sheet

Appendix A: How to Create a Detail Sheet Filename



Note:

- Entire filename cannot exceed 60 characters.
- Use the 'Kaizen ID Number Matrix for naming convention (see below)

(A - Assy; F – Facilities; P – Stamping; R – Plastics; T – Paint; W – Body Weld)

Third Digit

First Two Digits		0	1	2	3	4	5	6	7	8	9
00	Lighting	HID	Fluorescent	Outdoor	All	Other					
01	Building air supply	HVAC	HVU	SF	Exhaust System	Other					
02	Compressed Air/Blow Off	Nozzles	Blowers	Motors/Pumps	Drgers	Other	Compressor	Distribution	Vaouum lifters		
03	Paint Booths and Small Booths	CCP	AMU	Exhaust System	Scrubbers	Other	Room area	Air Flow	Supply & Applicatio		
04	Pre-treatment	CCP	AMU	Exhaust System	Pumps	ED Wash	ED Circulation	Phosphate Wash	e Circulation	Sealer process	Wet Sand, Other
05	Ovens/ Incinerators/ Melters/ Heaters	CCP	Assy Process Ovens	Incinerators	Casting/Holding Furnaces/	Casting Melters	Heat Treatment	Circulation fans/air volume	Combustion fans	Burners	Other
06	Conveyors/ Carriers	CCP	Motor			Other					
07	Washing Systems	CCP	AMU	Exhaust System	Motors/ Pumps	Other	Water				
08	Dust/Mist Collectors	CCP	Fan	Exhaust System		Other					
09	Cooling Water/ Coolant System	CCP	Towers	Motors/ Pumps	Nozzles	Other	Fans	Water or Coolant	Treatment		
10	Steam/ Hot Water Heat	CCP	Boiler	Dealkylyzer	Softener	Other	coils & Heat	Pumps	Combustion fans	Water	
11	Chilled Water	CCP	Chiller	Motors/ Pumps	Heat Exchanger	Other					
12	Presses/ Mold Machines	CCP	Motors/ Pumps	Lifters	Fans	Other	Press	Slush	IMM	m and others	
13	Machining	CCP	Grinding	Cutting	Motors/ Pumps	Other	Exhaust systems				
14	Casting Machines	CCP	Casting Machine	Exhaust System	Motors/ Pumps	Other	Metal Retaining				
15	Welders	CCP	Robot	Motors/ Pumps		Other					
16	Other	CCP	Motors/ Pumps	Lights	Heaters	Other					

Fourth Digit

0	1	2	3	4	5	6	7	8	9
Remove	Reduce	Replace	Alter/Add Controls	Install	Delay Start	Re-Circulate	Integrate	Clean	Change Chemicals
Eliminate	Decrease	Upgrade/Improve	Change/Add Set point	Add	Advance Start (Stop	Re-cycle/ Recover	Modify work procedure		
Turn off	Optimize	Convert/ Modify		Move/change	Change cycle time				